

## BELLCOMM, INC.

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WASHINGTON, D. C. 20024

SUBJECT: Potential Constraints on Increasing  
the Use of the CSM/LM Electrical  
Power Interface - Case.320

DATE: January 31, 1969

FROM: R. D. Raymond

MEMORANDUM FOR FILE

One possible method of increasing LM operating life-time is to use CSM power for LM checkout and operation prior to undocking. The benefits of using CSM power are mission dependent, i.e., the location of LM checkout within the mission profile determines the available savings. The potential disadvantages are generally independent of the mission, however, and are discussed here without reference to a specific mission. They are listed below as areas to be investigated if an evaluation is made of the desirability of expanding the CSM/LM electrical power interface:

1. Added hardware - The present interface is limited to low power transfer. New wiring, umbilicals, and switching would, of course, be required to effect an order of magnitude increase in the power transferred.
2. Electrical grounding - The CSM uses a single-point ground while the LM makes use of structure for some ground return paths. Careful redesign and test would be needed to prevent excessive electrical interference, e.g., sneak paths or other conducted interference, when these previously independent power distribution systems are interconnected.
3. CSM power capacity - The possibility of overloads must be investigated since the combined CSM and LM power loads can easily exceed the rated capacity of three fuel cells and will generally exceed the capacity of two fuel cells. The provisions for circuit protection and power regulation need to be reviewed.
4. Crew operations - The transfer of additional CSM power into the LM will introduce added crew operations for functions such as an additional umbilical connection and disconnection.

(NASA-CR-104049) POTENTIAL CONSTRAINTS ON  
INCREASING THE USE OF THE CSM/LM ELECTRICAL  
POWER INTERFACE (Bellcomm, Inc.) 3 p

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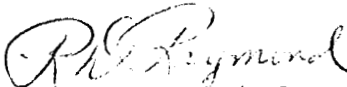
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5. Reliability - Reliability can be adversely affected by the added complexity required to operate the LM subsystems on either the CSM fuel cells power supply or the LM batteries power supply. Power regulation, distribution, and switching effects on system reliability should be evaluated.

2033-RDR-sep

  
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